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FIRST REPORT

BY THE

COMMITTEE ON BOULDERS

APPOINTED BY

THE ROYAL SOCIETY OF EDINBURGH,

IN APRIL 1871.

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BOULDER COMMITTEE APPOINTED BY THE ROYAL SOCIETY OF EDINBURGH, ON 21ST APRIL 1872.

SIR ROBERT CHRISTISON, *President of the Society.*

REV. THOMAS BROWN.

PROFESSOR GEIKIE (*Edinburgh.*)

DR ARTHUR MITCHELL.

PROFESSOR NICOL (*Aberdeen.*)

THOMAS STEVENSON, C.E.

PROFESSOR WYVILLE THOMPSON (*Edinburgh.*)

CAPTAIN T. P. WHITE, R. E.

PROFESSOR YOUNG (Glasgow.)

DAVID MILNE HOME (*to be Convener.*)

York Hotel
Albemarle St
Friday

Dear Sir

Knowing how impossible it is for people in this huge Metropolis to meet without an appointment, I take the liberty of asking whether you c^d^ give me an opportunity of a few minutes conversation with you to-morrow between 10 & 2 o'clock, at any place convenient to yourself;— or this afternoon after 4 P.M.

Yours very truly

David Mitchell Low

J. Campbell Esq
of Islay

I return on Monday Morning to Scotland

June 28. He came to
Luncheon and saw
maps and other things
asked me to write a
paper. Wrote one on
Sunday Morning 29th
and sent it to the
Hotel.

J. F. Campbell

Middry Lodge

FIRST REPORT.

In April 1871, a paper was read in this Society proposing a scheme for the conservation of boulder or erratic blocks in Scotland, in so far as they were remarkable for size or other features of interest. The Council of the Society approved of the scheme, appointed a committee to carry it out, and agreed to aid in meeting the expense of any circulars which might be necessary for conducting the inquiries.

The objects of the committee were twofold. They were first to ascertain the districts in Scotland where any remarkable boulders were situated; and, second, to select those which might be deemed worthy of preservation, with the view of inducing landed proprietors to give orders that they should not be destroyed.

The labours of the committee have as yet been directed only to the first of these objects.

In order to procure information, they drew out a set of printed queries, applicable to boulders apparently above 50 tons in weight, in order to ascertain the parish in which they were situated, and the names of the proprietor and tenant on whose lands they were; and also to learn other features, such as the nature of the rocks composing the boulders, their form, and the existence of striations upon them. Inquiry was also made whether the boulders had any traditional names or popular legend connected with them, or exhibited any artificial markings.

The committee thought that, with a view to the conservation of the boulders, the greater the interest which could be shown to attach to them, the more chance there would be of inducing proprietors and tenants to preserve such as the committee might select for preservation.

Besides queries about boulders, there was one query directed to

ascertain the occurrence of *kaimes* or *eskars*, *i.e.*, long banks of sand and gravel, as some persons imagined that the same agents which transported boulders might have had to do with the formation of these deposits.

Circulars containing queries, a copy of the minute of Council approving of the scheme, and appointing a committee, and an abstract of the paper read in the Society in April 1871, explaining the scheme, were transmitted to the ministers of all rural parishes in Scotland.

About 700 circulars were issued. After the lapse of six months about 100 answers were received.

The committee, on considering these, were of opinion, that in making their queries applicable only to boulders exceeding 50 tons in weight, they had probably erred, by excluding many boulders of interest, and to this circumstance they attributed the small number of answers sent.

They therefore resolved to issue another circular containing the same queries as before, to cover boulders exceeding 20 tons in weight. This circular was addressed to parochial schoolmasters, as the committee feared that they might be considered troublesome, if they made a second application to ministers of parishes.

This second circular brought to the committee a large amount of information, and they desire now to express their cordial thanks to both classes of reporters for responding so readily.

When the committee was appointed, an expectation was expressed that they should, from time to time, lay before the Society some account of their proceedings, and of the progress made by them.

In now proceeding to the performance of this duty, the committee will confine themselves to a statement of facts communicated, and avoid at present attempting to draw conclusions from these facts.

1. In order to show the situations of the boulders reported on, the committee have constructed a list,* according to counties, giving the names of the parishes where boulders occur, adding shortly any particulars regarding them, such as size, nature of the rock composing the boulder, direction of the longer axis, striations, popular names, and legend, if any.

* This list is in the Appendix.

They have also, on a general map of Scotland, indicated by a red cross the exact position of the most remarkable boulders.

From this table and map, it will be seen that *Perthshire* possesses the largest number of boulders, and also boulders of the greatest magnitude individually.

Ross and Cromarty stand next, then *Aberdeen, Argyll, Kirkcudbright,* and *Forfar.*

2. In regard to *size,* the largest boulder reported is one of granite, in the parish of Moulin, called "Clach M'hor" (big stone), being about eight yards square, and estimated about 800 tons.

There are two boulders between 500 and 600 tons weight, one in Ross, the other in The Lewis.

There are three boulders between 200 and 500 tons, seven between 100 and 200 tons, twenty between 50 and 100 tons.

3. With regard to the *nature of the rocks* composing the boulders, the largest reported are of granite, though there is one known to the convener of the committee, still larger, of conglomerate. The most numerous are composed of compact blue greenstone; but these are generally of small size. The next most numerous class are of grey granite. There are also many of gneiss, grey-wacke, and conglomerate.

4. The boulders reported generally *differ* in regard to the nature of the rocks composing them, from that of the rocks of the district in which they are situated; and, in many of the reports, reference is made to the district from which the boulder is supposed to have come.

Thus, in those parts of Perthshire, Forfarshire, and Kincardineshire where the old red sandstone formation prevails, and over which multitudes of granite, gneiss, and conglomerate boulders are lying, most of the reporters have no hesitation in pointing out that the parent rock is in the Grampian range, lying to the north or west. So also in Wigtonshire, where the greywacke formation prevails, and on which many boulders of grey granite are lying, the general opinion is that they came from the granite hills of Kirkcudbrightshire.

But where a boulder happens to be of a species of rock the same as that of the rocks of the neighbourhood, it is more difficult to recognise it as a true erratic. Hence, in the Lewis, where there are huge single blocks of gneiss, which is also the prevailing rock of

the country, the reporters say that they cannot tell whether these blocks are boulders or not.

5. The boulders mentioned in the reports are of various *shapes*. Some approach a square, well rounded of course on the corners and sides. That is the shape mostly possessed by granite boulders. Others again are long shaped, and this is particularly the case with whinstone and greywacke boulders. The difference in this respect is probably mainly due to a difference in the natural structure of the parent rocks.

A point of some importance occurs in regard to long-shaped boulders.

The direction of their *longer axis*, in the great majority of cases, is stated to coincide with the direction in which they have come from the parent rock, when the situation of that rock has been ascertained. Thus, in Auchterarder parish, there is a boulder 10 feet long by 6 broad, the longer axis of which points north-west. In Auchtergaven parish there is a granite boulder 10 feet long by 8 broad, the longer axis of which points due north. In Menmuir parish, Forfarshire, there are two large granite boulders, the one 14 by 9, and the other 13 by 9, the longer axis of which points north-west. In each of these cases the reporters seem satisfied of the situation of the parent rock, and in each case the longer axis of the boulder points towards it.

It appears, also, that where there are natural *striations or ruts* on the boulders, these almost always run in a direction parallel with the longer axis; and that when there are striæ crossing these, the number of such oblique striæ are comparatively few.

6. Notice in the reports is taken of the remarkable *positions* occupied by some boulders.

Thus, the Ardentinny report refers to a large boulder called "*Cluchan Udeluin*," or the nicely balanced stone, so-called, as the reporter states, because "it stands on the very edge of a precipice, and must have been gently deposited there." In the same parish there is another boulder, called "*The Giant's Putting Stone*. It is pear shaped, and rests on its small end. It looks," says the reporter, "as if a push would roll it over."

In Menmuir parish (Forfarshire), two boulders are reported, each from 30 to 40 tons in weight, and perched on or near the top of a

hill, having come there, as the reporter thinks, from a parent rock 15 miles distant, with several valleys intervening.

Cases of the same kind are reported from islands.

On Iona, near the top of the highest hill in the island, which is about 250 feet above the sea, there is a great boulder of granite. There is no granite in the island. The nearest place where that rock occurs is in the Ross of Mull, with an arm of the sea intervening.

In the Island of Eday, in Orkney, there is a conglomerate boulder, called the "*Giant's Stone*," about 8 tons in weight, near the top of a hill—the only one in the island—about 300 feet high. There is no conglomerate rock in Eday. But conglomerate rock occurs in the Island of Stromsay, situated to the south-east, a few miles distant.

7. The report from the parish of Benholm (Forfarshire), by the Rev. Mr Myres, gives information and suggestions to the committee of considerable interest. On the sea coast of that parish, two sets of boulders are described. One set are supposed to have come from the Grampian range many miles to the north-west, and consist of granite and gneiss rocks. But another set, also consisting of primitive rocks, are believed to be derived from a different source altogether, viz., from the great beds of conglomerate rock, which forms a band crossing the whole of Scotland from Stonehaven and Bervie, in a south-west direction, to Dumbarton and Rothsay. Some of the rounded masses in the conglomerate are stated to be several feet in diameter, and a few present appearances of striation; a fact which, if established, would prove that, at a very early period indeed, ice action had existed, and had formed boulders just as it did at a later period.

This report from Benholm parish was read lately at a meeting of the Geological Society of Edinburgh, and was illustrated by drawings and specimens which afforded strong evidence of the correctness of these views.

8. With regard to *kaims* or long embankments of gravel or sand, there are twenty-three parishes reported to the committee as containing them.

They appear to be most numerous in Aberdeenshire, Forfarshire, and in the east of Perthshire. In Kemnay parish there is a kaim said to be $2\frac{1}{2}$ miles long, running east and west. In Airlie parish

there is a kaim 2 miles long, also running east and west. In Fettercairn parish, Kincardineshire, and also in Tarbet parish, Rossshire, there are several kaims parallel to, and not far distant from, one another.

In two cases the reporters, who seem to have been in Switzerland, whilst mentioning kaims in their parishes, express an opinion that they are evidently lateral and terminal moraines.

In several cases, oddly enough, these kaims exist at much the same level above the sea, viz., between 700 and 800 feet, which happens also to be the height of similar deposits in Berwickshire and Mid-Lothian.

The committee wish it to be understood, that in the present report, they confine themselves simply to a statement of the nature of the information received. They do not think it would be wise as yet to attempt to draw theoretical conclusions. Almost every day they are receiving more answers to their circulars; and they think that the wider the basis for considering the important geological questions connected with the transport of boulders and the formation of kaims, there will be the more probability of reaching the truth.

One object which the committee have in view in explaining the nature of the information communicated to them, is to show and to acknowledge the deep debt of gratitude which this society lies under to the gentlemen who have responded to the circulars of the committee.

But whilst the information supplied is undoubtedly valuable, the committee cannot but feel the truth of what many of the reporters themselves modestly and properly state, that they are so little acquainted with geology or mineralogy, that they may not have correctly understood the queries, or they may not have made their observations in the way necessary to answer the queries. Moreover, the committee itself may not in all cases have rightly understood the answers given.

Having regard to these considerations, the committee would very much desire that the boulders reported should be examined by experienced geologists, who should at the same time make a survey of the district, in order to see whether it presents any special features bearing on the nature of the agency

by which the boulders were transported. The information in the reports received by the committee would greatly facilitate such an inspection, as they indicate not only the parish and the farm where the boulder is situated, but generally record other features of interest.

The committee entertain a hope, that were this wish on their part made known, some geologists, who may be either resident in Scotland or who may purpose to visit Scotland during the course of the ensueing summer or autumn, might offer their services in the way, and for the purpose now suggested. In that case, the committee would willingly lend the reports which they have received, on condition that the results of the inspection were made known to the committee.

The committee will place in the library of this Society, the list of boulders before referred to, showing the parishes in each county in which the boulders and kaims are situated, so that any person may see where these parishes are, and be able to judge whether it would be convenient for him to visit these.

Were this list published, and generally circulated, good would result in another way. As it would show all the parishes from which reports of remarkable boulders and kaims had come, some persons might be able to discover parishes from which reports had been omitted to be sent, and if these were pointed out to the committee, they would make the requisite inquiry.

II. The committee proceed next to notice points of *archaeological* interest connected with boulders.

1. The committee were surprised with the large number of individual boulders possessing names by which they were known in the district.

The names may be classified under several heads:—*First*, there are names having reference to the agency by which the boulders were supposed to have come into the district. *Second*, there are names indicative of the use to which boulders were put. *Third*, there are names making the boulders commemorative of certain events.

Many of the boulders, besides having a name, have also a *legend*, which explains and illustrates the name.

The *Giant's Stone*, *Fingall's Putting Stone*, the *Witches' Stone*,

the *Carlin Stone*, *Heathens*, *Hell Stones*, the *Deil's Stone*, the *Deil's Putting Stone*, the *Deil's Mither's Stone*,—these are among the names, almost all in the Gaelic language, which apparently were given to account for the way in which particular boulders came into the district.

To show that this was the origin and object of the names, a few of the legends, as stated in the reports, may be given. They indicate, no doubt, a very deplorable state of ignorance and credulity; but they indicate also that in many cases our forefathers had satisfied themselves that the boulders had been transported into the district. Their perplexity was how to account for their transport. Not knowing anything of glaciers or icebergs, they had to resort to supernatural agency for an explanation. A few examples may be given.

Reference has already been made to a large conglomerato boulder near the top of a hill, in the Island of Eday, one of the Orkneys. It goes under the name of "*Giant's Stone.*" The legend for it is, that it was flung by a giant from the Island of Stromsa. Now, as already stated, there is no conglomerate rock which could have supplied the boulder in Eday Island, but there is in Stromsa.

So also in the Island of Sanday, there is a granite or greiss boulder; and the legend about it is, that it was thrown from the Shetland Islands by a giantess, who had been jilted by a Westray man. She intended to throw it into Westray, but she made a bad shot, and it fell into the Island of Sanday. There is no rock which could have produced the boulder in Sanday, but there is abundance of it in the Shetlands.

About 1½ miles west of St Andrew's in Fife, there is a large conglomerate boulder, and the legend about it is, that when the "*Four knockit steeple*" in that town was being built, a giant who lived at Drumcarro Crags, a hill about 5 miles to the north-west of St Andrews, was indignant, and resolved to demolish the edifice. He, therefore, got the largest stone he could find, and borrowing his mother's apron, he made a sling of it, and threw it at St Andrews. But the stone being too heavy, the apron broke, and the stone did not quite reach its destination, and there it has lain ever since. There is no conglomerate rock where the boulder lies, but there is at or near Drumcarro Crags.

The Witches' Stone, which is on the estate of Pitferran, near Dunfermline, has this legend: A witch who lived among the hills to the west, wishing to confer a favour on the Pitferran family, resolved to give them a cheese-press, the heaviest she could find. She selected a large block of basalt of the proper shape, and carried it in her apron, which, however, broke under the load before she reached the family residence; and there it has lain ever since. There is no rock of that kind near Dunfermline, but there is to the westward.

In the parish of Carnwath there are one or two spots where there are groups or collections of whinstone boulders, between the river Clyde and a hill of whinstone known by the name of the *Yelpin Craggs*. The distance between the river and this hill is three or four miles. These heaps of boulders have from time immemorial gone by the name of *Hellstones*, insomuch that places near them are called *Hellstones Loan*, *Hellstones Road*, &c. The legend is, that Michael Scott and a great band of witches, wishing to dam back the Clyde, gathered stones at the *Yelpin Craggs*, and were bringing them towards the Clyde, when one of the young witches, groaning beneath her load, cried out, "Oh Lord, but I am tired." As soon as she uttered the sacred name, the spell broke, the stones fell down, and have remained there ever since.

There are many legends founded on the agency of the devil, and on his hatred of churches and clergy. Thus near the old church of Invergowrie, now in ruins, there is a large whinstone boulder, called the *Paddock Stone*. The legend about it is, that the devil, going about in Fife, descried the church shortly after it was begun to be built, and wishing to stop the work, threw a large stone at it across the Frith of Tay. There is no whinstone rock at or near Invergowrie, but there is abundance of it immediately opposite in Fife.

In the parish of Kemnay (Aberdeenshire), there is a boulder of grey granite, called the *Devil's Stone*, estimated to weigh about 250 tons, which lies not far from the old kirk. There is no rock of that nature in Kemnay parish, but there is at Bennachie, a hill about seven or eight miles to the westward. The legend explaining how this boulder came from Bennachie forms the subject of a ballad,* a few verses of which I may perhaps be allowed to give.

* From "Flights of Fancy and Lays of Bon Accord." By William Cadenhead, Aberdeen. Edinburgh: Oliver and Boyd, 1853).

" It was the feast o' Sanct Barnabas,
I' the merry month o' June,
When the woods are a' i' their green livery,
And the wild birds a' in tune ;

" And the priest o' Kemnay has gaen to the kirk,
And prayed an earnest prayer,
That Satan might for ever be bound
To his dark and byrnand lair.

" And aye the haly organ rang,
And the sounds rose higher, higher,
Till they reached the fiend on Bennachie,
And he bit his nails for ire.

" And he lookit east, and he lookit west,
And he lookit aboon, beneath ;
But nocht could he see save the baul' grey rocks
That glower'd out through the heath.

" He lifted aloft a ponderous rock,
And hurl'd it through the air ;
' 'Twere pity ye sud want reward
For sae devout a prayer ! '

" The miller o' Kemnay cries to his knave,
' Lift up the back sluice, loon !
For a cloud comes o'er frae Bennachie
Eneuch the mill to droon.'

" The boatman hurries his boat ashore,
And fears he'll be o'er late ;
Gif yon black rock come doon in rain,
It 's fit to raise a spate.

" But the ponderous rock came on and on,
Well aimed for Kemnay Kirk ;
And cross'd it field, or cross'd it flood,
Its shadow gar'd a' grow mirk.

" But the fervent prayers o' the haly priest,
And the power o' the Sanct Anne,
They turn'd the murderous rock aside,
And foil'd the foul fiend's plan.

" And it lichted doon frae the darken'd lift,
Like the greedy Erne bird,—
And there it sits i' the kirk-lands yet,
Half-burried in the yird."

These legends, in explanation of the transport of Scotch boulders, are of the same nature as the legend which professes to explain how the Blue Stones of Stonehenge came to Salisbury Plain in England. Jeffrey of Monmouth, who was the first author to write a description of Stonehenge, says that certain of the stones were brought by Merlin and a band of giants from Ireland. I see that Mr Fergusson, in his book on Ancient Stone Monuments, recently published, says that some geological friends of his have told him, that these blue stones of Stonehenge are a species of trap, which is not known in England, but is well known in Ireland; and therefore Mr Fergusson supposes that they probably were brought from Ireland in ships. It seems to me quite as likely that these blue stones were boulders, and were brought from Ireland by natural agency, and deposited on Salisbury Plain in that way. There are strong proofs to show that there was an agency of some kind which swept over Ireland from the westward, and brought boulders and pebbles across what is now the Irish Channel to the south-west districts of England.

In these legends we see the efforts of the people in these early times to account, in the best way they could, for the transport of boulders into their districts. It is evident that they had investigated the subject, and had made considerable approaches to the truth. Finding that many of these great blocks differed in composition from all the rocks of the district where the blocks lay, and inferring that their round shapes were probably due to the friction of travelling, they inferred that they must have come into the district from some distant quarter; and this inference was confirmed by discovering that in certain other districts there was rock of the same description as the blocks. But how blocks exceeding 100 tons weight could have been brought many miles, and over a tract of country uneven and broken in its surface, their knowledge of nature's laws did not enable them to explain. The only agency which they could think of was superhuman and supernatural; and hence the invention of such legends as assumed the agency of Merlin, giants, Michael Scott, witches, and the devil.

2. The second class of names by which particular boulders are known, have reference to the *uses* to which these stones were put.

In remote periods in the history of Scotland, when there were no

maps, roads, or even names of parishes, it was important to have some other means of indicating spots or districts where people required to congregate for special purposes.

One of the boulders reported to the Committee (in the Island of Harris), still goes by the name of "*Clachan Tresail*," or the Gathering Stone.

What were the special purposes for which our early forefathers gathered together is of course not easily discovered. But the ancient names of the boulders seem to throw light on the subject. (1.) Such names as "*Clach-shleuchda*," or Stones of Worship (in the parish of Kirkmichael); "*Clach an Tobert*," or Stone of Sacrifice; "*Clach na Greine*," Stone of the Sun; "*Clach na h'Annait*." Stone of Victory, (a Scandinavian deity); and "*Clach m'hor a Che*," Great Stone of Che, (another deity), seem very plainly to indicate that these boulders were used as trysting-places for *worship;* and they were all the more suitable if they were looked upon with superstitious awe, on account of their supposed connection with spiritual agency. On two of the boulders reported to the Committee, there are artificial circular markings, other examples of which are very numerous throughout Scotland; and though archæologists are not yet agreed as to the meaning of these marks, one theory is, that they were symbols of a religious character. It is well known that these great stones were in some way or other, hindrances to the reception and diffusion of Christianity in most of the countries of Western Europe; for between the years 500 and 800 there are numbers of decrees and edicts requiring these stones to be destroyed, as being objects of superstition. There are some archæologists who go so far as to maintain that the word "Kirk" is actually synonymous with the word "Circle," meaning the circle of stones where Celtic worship was performed.

(2.) Another use to which these boulders were applied was *Sepulture*. I have on my own property, in Berwickshire, a boulder known by the name of the "Pech or Pict's Stone," round which human bones in very large quantities were found a few years ago; and similar discoveries have been made at boulders in many other districts, especially where they formed circles.

If these great boulders were used as places of worship, it was natural that they should also be used for sepulture, on account of

the supposed sanctity of the place. Indeed, the fact of a place having been used for sepulture, creates of itself a presumption that it was used also for worship.

(3.) Another important purpose for which the boulders were used, was for the *trial of offenders* and the issuing of *judicial sentences*. Thus, in Little Dunkeld parish, there is a large boulder called "*Clach a mhoid*,"* or Stone of the place of Justice, where the baron of the district could try *offenders*, with right to hang or drown those convicted. In Ayrshire there is another large boulder called the *Stone of Judgment*, for the barony of Killochan. Several large rocking stones have been reported. In ancient times, when very rude tests of guilt or innocence were employed, the rocking stone was used in the trial of persons accused of crimes.

> "It moves obsequious to the gentlest touch,
> Of him whose breast is pure. But to the traitor,
> Though even a giant's prowess nerved him,
> It stands as fixed as Snowdon."

(4.) There are boulders which are known to have been used as *trysting places* for military gatherings. It was on a whinstone boulder called *The Bore Stone*, that Robert Bruce planted his standard before the Battle of Bannockburn. A whinstone boulder on the Borough Muir, near Edinburgh, was the gathering point for the army collected by James IV. before the Battle of Flodden. Both of these stones are in existence. The Bannockburn stone is protected by an iron grating. The other has not been so well treated, at which we need not be surprised.

(5.) Some boulders are said to have been used as trysting places for the *contracting* of *engagements*, such as matrimonial contracts, and others less important. There is a boulder in the parish of Coldstream (Berwickshire), called the *Grey Stone* from its colour, at which within the last hundred years marriages took place. The bride and bridegroom stood on tiptoe on each side of the stone and joined hands over the top, whilst the friends of each party surrounded the stone to witness the engagement. The *Stone of Odin*, in the Orkneys, at which marriages were celebrated, was held in peculiar veneration; for in one case where a man who prosecuted for deserting his wife, it was stated to be an aggrava-

* New Stat. Acc., vol. x. p. 1007.

tion of his offence, that they had been married at the Stone of Odin.

3. A third class of names given to boulders had relation to them as *commemorative of important events.*

Thus there is in Badenoch the "*Clach an Charra,*" or Stone of Vengeance, so called because a profligate and tyrannical feudal baron was killed by his own people near it.

There is in Lewis the "*Clach d'hois,*" or Stone of D'hois, a boulder of gneiss, weighing about 120 tons. It is called after a person named D'hois, who slew a giant near the boulder, and who also himself died immediately after, from the wounds received in the conflict.*

4. Some boulders were used to mark the boundaries of estates, parishes, and counties, and are still in many parts of Scotland recognised as affording evidence on that subject.

In Ross-shire, the boundary between the districts of Urray and Contin is marked by the boulder called "*Clachloundron.*"

A great boulder is said to indicate the spot where the three counties of Dumfries, Ayr, and Lanark meet.

The line of boundary between England and Scotland was in the eastern borders originally indicated by boulders, several of which still remain.

5. Some of the boulders have curious popular predictions connected with them.

Thus, near Invergowrie, on the north side of the Frith of Tay, there were in the days of Thomas the Rhymer two boulders entirely surrounded by the water, of which the seer sang—

> "When Gows of Gowrie come to land
> The day of judgment's near at hand."

These two boulders, called the Gows (probably because always frequented by sea-gulls), are now no longer surrounded by water. But it is not they which have come to land, the land has come to them.

In the parish of Crieff a boulder of whinstone is reported, with a vein of white quartz through and partially round it, in consequence of which the stone has from time immemorial been

* This Boulder and its legend reported to the committee by Captain Thomas, R. N.

known as the *Belted Stane*. The prediction about it is, that the white belt will gradually increase in length till it envelopes the stone; and that whenever the two ends meet, a great battle will be fought, on which occasion a king will be seen mounting his horse at the stone,—

> "Twixt the Gartmore Gap and *the Belted Stane*
> The nobles bluid shall run like a stream."

Geologists, however, are of opinion that there is not much chance of the quartz vein extending.

Perhaps some persons may think that I ought not to be occupying the time of the Royal Society by referring to these absurd popular legends. My reasons for referring to them are twofold. In the *first* place, they are evidence of the large amount of ignorance and superstition which prevailed in former times in our own land, and even at no very distant date. In the *second* place, the archæological and even historical associations with which many of the boulders are interested, may induce many proprietors to take an interest in them and save them from destruction, if the committee think them worthy of preservation.

There is even yet among our fellow-countrymen a considerable amount of interest felt in these boulders, and particularly such as have traditionary names and legends; and it is to this feeling that several are indebted for their preservation. Professor Geikie at the last meeting of the British Association told this anecdote of the Ayrshire boulder, known as the Killochan Stone of Judgment. An enterprizing tenant, a stranger to the district, finding this stone much in his way, was preparing to blow it up with gunpowder. His intention becoming known, some of the old residenters went to the laird's factor and asked whether he knew what was intended. On his stating that he did not, he was entreated to prevent the stone from being destroyed. The proprietor was communicated with, and the new tenant was interdicted from meddling with the stone. Shortly afterwards this inscription was put on the stone,—"*The Baron's Stone of Killochan.*"

In the parish of Rattray, there is a remarkable boulder of micaceous schist, weighing about 25 tons, of which some account was given a short time ago in this Society. It bears a number of artificial markings of a very ancient date. The tenant of the farm

on which it is situated proposed to blow it up. Some of the inhabitants having heard of this, went to the minister of the parish, and begged him to take steps to save the old stone of Glenballoch. The proprietor being on the Continent, the rev. gentleman applied to the factor, and through his good offices saved the stone. This gentleman being still under anxiety about it, lately requested this committee to communicate with the proprietor, Colonel Clark Rattray, with the view of obtaining from him a promise that the stone should be preserved. Colonel Clark Rattray was accordingly written to by the convener of the committee, and he at once acceeded to the request.

There is on the shore at Prestonpans, on the south side of the Firth of Forth, a large basaltic boulder, which has long been known under the name of "*Johnny Moat.*" Being desirous of seeing this boulder, I went out from Edinburgh a few weeks ago by rail to Tranent Station, and walked towards the shore in search of it. Between the railway station and Prestonpans I met a boy, whom I stopped, and telling him that I had come to see the boulder called "Johnny Moat," I asked the way. He told me at once. I had, however, to ask three or four other persons in succession, two of them women, the same question before I found the spot. Every one knew "*Johnny Moat.*" The last person whom I accosted was a fisherman, and he volunteered to be my guide. He seemed somewhat suspicious of my intentions; for after taking me to the stone, he remained beside me, till he saw that it was only to measure its dimensions and make a sketch of it, that I had come. From what I observed during this visit, I feel sure that every inhabitant of Prestonpans, not only knows of this boulder, but takes a personal interest in it, and would sternly resist any attempt to destroy it.

It is satisfactory to find this popular feeling still prevailing to some extent But the feeling is not of itself sufficient to prevent the wholesale destruction which is going on in many parts of Scotland. Thus, the minister of Bendochy reports to the committee, that "on the rising ground behind his manse, there was a circle of large stones, boulders, standing on their ends (Druidical); but some years ago they were removed. The place is yet called '*The Nine Stanes.*'"

There was formerly a rocking stone in Aberdeenshire, estimated at about 50 tons weight; but it has now been converted into field dykes.

Numberless cases of the same kind can be specified.

It is therefore most necessary to take steps to preserve what remain of these megalithic relics; and it is especially gratifying to the committee to be able to state, that the movement towards this object, made by this Society, has met with general approval.

The British Association, at its last meeting, so highly approved of the scheme, that it appointed a committee of some of its most influential geologists to carry out a similar scheme for England and Ireland.

In the last number of the "Geological Magazine," there is a laudatory notice of the object and operations of the committee; and the readiness with which all parties applied to in Scotland have responded to the circulars of the Committee, proves how much they also approve, to say nothing of express commendations contained in individual reports. Even in Switzerland notice has been taken of our Scottish movement, and in very complimentary terms; for a few weeks ago, a pamphlet by Professor Favre of Geneva was received by the convener, alluding to our Society's movement in this matter, and anticipating important results from it.

DAVID MILNE HOME,
Convener of Committee.

LIST OF BOULDERS REPORTED TO ROYAL SOCIETY, ARRANGED BY COUNTIES AND PARISHES.

Aberdeen.

Aberdeen (Town).—In excavating for foundation of house in Union Street, boulder of black sienite, 6 × 5 × 4 feet found. No rock like it *in situ* nearer than Huntly or Ballater, about 30 miles to N.W. or W. Under surface of boulder, striated. The direction of striæ coincides with the longer axis of boulder. Preserved, and set up in Court of Marischall College. (Reporter—Professor Nicol.)

Ballater.—On top of Morven, 3000 feet above sea, several granite boulders, unlike rock of hill, and apparently from mountains to west. (Jamieson, "Geol. Soc. Jour.," xxi. p. 165.)

Bourtie.—1. Four Greenstone boulders, supposed to be Druidical; what is called "The Altar Stone," 16 × 6 × 5 feet, weighs about 18 tons. 2. Boulder, about 20 tons. Longer axis E. and W. Called "Bell Stane," the church bell having once hung from a post erected in it. 3. Whinstone boulder, about 20 tons, on Barra Hill, called "Wallace's Putting Stane," 24 feet in circumference. Legend, that thrown from Bennachie Hill, distant about nine miles to west. 4. Whinstone boulder, called "Piper's Stone." Origin of name given. 5. Whinstone boulder, called "Maiden Stane." Tradition accounting for name. 6. Several Druidical circles described. (Reporters—Rev. Dr Bisset, and Mr Jamieson of Ellon.)

Braemar.—At head of Glen Sluggan, several large erratics. These stand exactly on watershed or summit level. Near shooting-lodge there, a cluster of four or five immense angular granite boulders. They touch one another, and may be fragments of one enormous mass. The adjacent rock is quartz. These blocks situated at end of a long low ridge or mound, which extends from south extremity of Ben Avon Hills, and which strewn thickly over with great granite blocks. The mound composed of a mixed debris of earth and stones, and is apparently a moraine. The adjoining mountain of "Cairn a

Drochid " is composed of quartz and granite. On top of it are large granite boulders, many of which situated on quartz rock. (Reporter—Mr Jamieson, Ellon, in letter to convener.)

Chapel Garioch.—Boulder, $19 \times 15\frac{1}{2} \times 11\frac{1}{2}$ feet, weighing about 250 tons. Longer axis E. and W.; striæ on it E. and W. Legend, that thrown from Bennachie Hill to west. The rock of boulder differs from rocks adjoining. Kaims abound in parish. (Reporter—Rev. G. W. Sprott.)

Cruden.—In Boddom Dean, a granite boulder called "The Hanging Stone," measuring 37 feet in circumference and 27 feet over it, resting on several small blocks of granite. Supposed to be Druidical. (Buchan's Peterhead, published in 1819.) Huge granite boulder, called "The Gray Stone of Ardendraught," broken up in 1777 to build walls of Parish Church. It was the stone on which "Hallow" fires* used to be lighted. (Jamieson, "Geol. Soc. Jour.," xiv. p. 525.)

At Menie Coast Guard Station, granite boulder, 54 feet in circumference and 7 feet above ground; also a greenstone boulder, 78 feet in circumference and 6 feet above ground. (Jamieson, "Geol. Soc. Jour.," xiv. p. 513.)

Near the "Bullers of Buchan," there stands "The Hare or Cleft Stone," which marks the boundary between the parishes of Cruden and Peterhead. (Pratt's "Buchan," 1858, page 47.)

In this parish, and to north, numerous mounds and ridges of gravel, called at one place "Hills of Fife," at another, "Kippet Hills." The generic name of these mounds and ridges in this part of Scotland, is Celtic word "Druim" or "Drum." They are composed sometimes of sand, more frequently of gravel. The gravel consists of fragments of rock,

* "Hallow" fires were lighted on 31st October, and were called "Saimhtheine." The "Beil-theine" fires were lighted on 1st May. These practices, formerly general in the Highlands of Scotland, were probably connected with the worship of the sun, whose departure in autumn, and return in spring, were signified by these rites. The Rev. Mr Pratt published an account of Buchan in the year 1858, and states (page 21), "Hallow fires are still kindled on the eve of All Saints, by the inhabitants of Buchan—from sixty to eighty fires being frequently seen from one point." (Old Stat. Acct. of Scotland, vol. xi. p. 621, and vol. xii. p. 458).

generally from westward. They are always well rounded, by the friction they have undergone. They sometimes reach a size of 2 feet in diameter. The pebbles are chiefly gneiss.

On top of some of the knolls and ridges there are large boulders. There is one, near Menie, being a coarse crystalline rock, with a greenish tint, 8 × 5 feet. Another boulder of greenstone lies near it. Very frequently a stratum of red clay lies over the gravel ridges, encircling the base of boulders, indicating that after the gravelly ridges had been formed, and the boulders deposited, muddy sediment had been deposited in deep water.

Beds of clay exist in two states. There is *boulder* clay, unstratified, and containing many pebbles and boulders; also occasionally some sea shells, which, however, are almost always found crushed and broken. There is *laminated* clay, the sea shells in which are generally entire and uninjured.

Many of the shells are Arctic, and of the kind found in sea from 30 to 100 fathoms deep.

In valley of Deveron, and also in valley of Spey, terraces, on each side, apparently formed by water, at heights of from 360 to 420 feet. But in Spey valley, these terraces not horizontal, as they seem to rise up towards head of valley. (Jamieson, "Geol. Soc. Jour.," xiv., p. 526.)

Culsalmond (Garioch).—Boulder of blue gneiss, $6\frac{1}{2} \times 2\frac{1}{2}$ feet, known as the Newton Stone, containing Ogham and other very antique inscriptions. (Professor Nicol in letter to Convener.)

Ellon.—At junction of Ythan and Ebrie, sienitic greenstone boulder, $22 \times 9\frac{1}{2} \times 8\frac{1}{2}$ feet, resting on gneiss. Near same place, another still larger. All these boulders have come from W. or W.N.W. (Jamieson, in letter to Convener.)

Glass (5 or 6 miles west of Huntly).—Five blocks called "*Clach Dhus*" (Black Stones), on Tod Hill. Girth of each about 50 feet, and height from 10 to 12 feet. Being of same rock as hill, not certain whether brought from a distance. Other boulders on hill apparently different from adjoining rocks. Height above sea about 1000 feet. (Reporter—J. F. Macdonald, Parochial Schoolmaster.)

Kemnay.—Boulder, 38 × 30 × $10\frac{1}{2}$ feet, about 300 feet above sea;

longer axis, E. and W. Boulder, 35 × 30 × 10 feet, about 325 feet above sea; longer axis N. and S. Boulder, 25 × 23 × 8, about 325 feet above sea; longer axis, E. and W. Boulder, 28 × 25 × 8, about 325 feet above sea; longer axis N. and S. Boulder, 30 × 28 × 10, about 360 feet above sea; longer axis, N. and S. Boulder, 33 × 27 × 6, about 360 feet above sea; longer axis, N. and S. Boulder, 21 × 20 × 3. Boulders are gneiss, whilst rocks adjoining are granite. On Quarry Hill, situated to north, 600 feet above sea, the rocks show striations indicating movement from west. Kaimes in valley parallel with valley running N.E. and S.W. for two or three miles. Legend, about devil throwing boulders at church from Bennachie Hill, situated to west about eight miles. Mr Jamieson of Ellon referred to, as thinking, that boulders came from Benavon, a hill forty miles to N.W. by W. (Reporter—Rev. George Peter, M.A., parish minister.)

Logie Coldstone.—This parish thirty miles N.W. of Aberdeen. Surrounded at N.W. by amphitheatre of hills, of which Morven 2850 feet high. It contains numerous mounds of gravel and sand, in layers, showing action of water. They have the form of "kaims." Though there are no boulders, there are pebbles up to a *cwt.* or more, imbedded in water-worn gravel and fine sand. The pebbles are of same rock as adjoining hills—gneiss, granite, and hornblende. Two singularly shaped mounds, one 60 feet high, the other composed entirely of sand. They resemble the terminal moraines seen in the Grinderwald and other parts of Switzerland. Some years ago a number of boulders (from 3 to 6 tons in weight) were destroyed at a place situated to the north of this. They were of a soft, bluish granite, differing from any granite rock within a distance of nine or ten miles. One of these boulders might weigh 20 tons. This place had all the appearance of an ancient lake. The boulders may have been brought to it by same agency as that now seen on the Märjelin See, near Aletsch Glacier. (Reporter—J. G. Michie, Schoolhouse, Coldstone, Tarland.)

New Deer.—A great number of boulders, from 1 cwt. to several tons, lie in a sort of line for more than a mile S.E. from farm

of Green of Savoch, as far, at least, as the hill of Coldwells and Toddlehills, in parish of Ellon. At Toddlehills these boulders are quarried out of the gravel. Elsewhere they are mostly on surface. Locally called "Blue Heathens." On Whitestone Hill, Ellon, and on Dudwick Hill, chalk flints are exceedingly abundant. (Reporter—James Moir, Savoch, by Ellon.)

In this parish formerly there was a rocking-stone, called "The Muckle Stone of Auchmaliddie." On the Hill of Culsh, formerly a Druidical circle. About seventy years ago the stones were carried away to aid in building a manse. Farm where situated still called, "The Standing Stones of Culsh." (Rev. J. Pratt's Account of Buchan, 1858.)

Towie.—Stone of unhewn granite, standing about 7 feet above ground, on north side of river Don, near bridge. Supposed to be Druidical ("New Statistical Account" of parish).

Argyll.

Appin.—Granite boulder $20 \times 18 \times 11$ feet, about 290 tons. Differs from adjoining rocks. Longer axis N.E. Striated. Apparently has come from head of valley, which to N. or N.E. There is also a line of boulders;—rocks striated in direction of glen. (Reporters—James M'Dougall and Sir James Alexander, who sends a sketch.)

Ardentinny.—1. Boulder, called "Pulag" (Big Round Stone), about 30 tons. In critical position on edge of cliff. 2. Boulder, called "Giant's Putting Stone," pear-shaped, and rests on small end. 3. Boulder, called "Clachan Udalain" (nicely-balanced stone), larger. (Reporter—Rev. Robert Craig.)

Duncansburgh (near Kilmallie).—Granite boulder, $7 \times 5\frac{1}{2} \times 5$ feet, called "Trysting Stone." Tradition. There are larger boulders nearer Ben Nevis. (Reporter—Patrick Gordon, min., *Q. S.* Duncansburgh, Fort-William.)

Dunoon (Kirn).—Trap boulder, $21 \times 14 \times 7$ feet, about 164 tons. The adjoining rocks are mica schist and clay slate; striated. Photograph sent. (Reporter—Rev. James Hay, minister of Kirn.)

Glencoe.—Trap boulder, about 90 feet in girth and about 10 feet high. It is nearly round, and lies on an extensive flat, so that very conspicuous from a distance. (Reporter—Captain Whyte, R.E.)

Inishail (North of Inverary).—Granite boulder about 8 feet above ground, called "Rob Roy's Putting Stone," about 1 mile from Taynuilt Inn on Oban road, about 60 feet above sea. A mountain of same rock about 1 mile distant. Longer axis, E. and W. Due west from above about 1½ miles, another boulder on a ridge on side of Loch Etive, in Muckairn parish. Several large boulders on road between Dalmally and Tyndrum; also on road between Tyndrum and Black Mount, about 4 or 5 miles from Tyndrum. A fine boulder on Corryghoil farm (Mr Campbell) between Inishail and Dalmally. (Reporter—Rev. Robert M. Macfarlane, minister of Glenorchy and Inishail).

Iona (Island).—Granite boulder, 24 × 18 × 6 feet, 100 tons. Longer axis N.W. There are a great many others, chiefly on E.S.E. side of island, opposite to Ross of Mull, from which boulder supposed to have come. On other hand, Duke of Argyll is said to consider that the granite of the boulder, is not the same variety as that of Ross. There are several boulders oddly placed near top of highest hill on N.W. side. (Reporter—Allan M'Donald, parish schoolmaster.)

Kerrera Island.—Opposite to Oban, striæ on rocks show movement from N. 60° W. Striæ between Oban and Loch Awe on rocks 200 feet above sea. Striæ between Gairloch and Loch Long, from N. 60 W.; slanting over ridge of hill. (Robert Chambers' "Edin. New Phil. Jour.," liv., p. 255.)

Kilbrandon (Easdale by Oban).—On Lord Breadalbane's estate, grey granite boulders from 21 to 28 feet in girth, and standing from 3 to 4 feet above ground. Longer axis generally N.W. Ruts or grooves on tops and sides of some, bearing N.W. These boulders sometimes single, sometimes in groups, sometimes piled on one another. Occur at all levels from shore up to hill tops. No granite *in situ* nearer than Mull, which is 15 or 20 miles distant to N.W. (magn.) (Reporter—Alexander M'Millan, schoolmaster, Kilbrandon.)

Kilmallie.—Boulder, 12 × 10 × 10 feet, about 100 tons. There is another, said to be larger, in the distant moors; also quartz boulder, about 9 feet square, supposed to have come from Glenfinnan, about 15 miles to N.W. by W. (Reporters—Rev. Arch. Clerk, and C. Livingston, schoolmaster.)

Kilmore and Kilbride (near Oban).—Granite boulder, 12 feet long; diameter of shortest axis, 5 feet; longer axis, E. and W. A few feet above sea mark. Adjacent rocks conglomerate. Another stone, about 200 yards distant, called "Dog Stone," of which photograph sent. It is a conglomorate. (Reporter—C. M'Dougall, Dunollie, Oban).

Saddell (Kintyre).—Several small granite boulders, though there are no granite rocks in Kintyre. A good many whinstone standing stones. (Reporter—Rev. John G. Levach, Manse of Saddell.)

South of Campbelton, many granite boulders, like Arran granite, one near Mosharioch, 4 × 5 × 2 feet. (Reporter—Professor Nicol, Aberdeen.)

At Southend, a boulder of coarse grey granite, about 18 feet in circumference, and weighing more than 3 tons, now broken up.

Another granite boulder, about 12 feet feet in circumference.

Two boulders of sienite, each 2 or 3 tons, about 200 feet above sea.

No granite rocks in neighbourhood. Rocks chiefly limestone and red sandstone. (Reporter—D. Montgommerie, Southend parish school.)

Ayr.

Coylton.— Granite boulder, 11 × 7½ × 5 feet, about 30 tons. Longer axis N. and S. There are four more boulders, about 4, 8, and 12 tons. They form a line running N. and S. Legend, that King Coil dined on large boulder. (Reporter—Rev. James Glasgow.)

Dailly.—Granite boulder about 36 tons on Killochan Estate, called "The Judgment Stone." About 100 feet above sea. Lies on Silurian rocks. Apparently derived from granite hills situated S.S.E., near Loch Doon, about 13 miles distant.

Boulder proposed to be blown up by tenant of farm. But old inhabitants interposed, and an inscription put on it by proprietor, Sir John Cathcart, in these terms, "The Stone of the Baron of Killochan." Granite boulders of various sizes, on hill slopes, south of river Girvan. One on Maxwelton farm 800 feet above sea, contains 240 cubic feet. Another, 16 feet long, on top of Barony Hill above Lennoxlove, mostly buried under turf. Level mark on it by Ord Surveyors of 1047 feet above sea.

Doone Loch.—Two miles south of,—a granite boulder, about 25 × 20 × 12 feet, called "Kirk Stane." (Seen by Convener.)

Girvan.—Thousands of granite boulders for miles along shore near Turnberry Point, and some whinstones. Rocks *in situ* sandstone. (Reporter—Thomas Stevenson, C.E.)

Along coast 4 miles south, in a ravine, two boulders of altered Greywacke. Largest, 17 × 13 feet, and weighs 180 tons. Other weighs about 100 tons. Have probably come from hills to S. or S.E.

Maybole.—Granite boulder, flat and oblong, on slope of hill above river Doon, on Auchindrane, at height of 230 feet, known as Wallace's Stone, from tradition, that a rude cross carved on it represents the sword of that hero. (These cases from Dailly, Girvan, and Maybole, communicated by Professor Geikie).

Banffshire.

Banff.—In district between Banff and Peterhead, beds of glacial clay, of a dark blue colour, very similar to beds in Caithness, and probably drifted from Caithness. Near Peterhead, many boulders of granite and trap. One of these, $4\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$ feet, a fine grained tough trap, of a greenish colour, not known *in situ* in Aberdeenshire, but occurs in Caithness. (Jamieson, "Geol. Soc. Jour.," xxii. p. 272.)

Boyndie—Hypersthene boulders along shore, and found for some miles running S.W. Supposed to have come from rock to S.E., called "Boyndie Heathens." (Reporter—James Hunter, Academy, Banff.)

Fordyce.—A line of boulders can be traced running through parishes of Ordiquehill, Marnock, Grange, Rothiemay, and

Cairney, in a direction S. and N. The boulders are a blue whinstone. In Ordiquehill parish, boulders, so close as to almost touch. They are called "Heathens." 500 feet above sea. (Reporter—Parish minister.)

BUTE.

Arran.—Several large granite boulders on east side of Island. Some small conglomerate boulders near Lamlash. "Cock of Arran," at north end of island, a Sandstone boulder. (Reporter—Rev. Colin F. Campbell, Kilbride.)

Kingarth (S. end of Island).—Along coast, boulders form lines a few feet above sea level.

CAITHNESS.

Clyne.—At Clynelish quarry, near Brora, striations W. by N. on Sandstone rocks due to local glaciers formed in Brora valley. (Chambers' "Edin. New Ph. Journal.")

Dunnet.—Conglomerate boulder of small size, apparently from "Maiden Pap" Hill, thirty miles to south. Several large boulders in parishes of Olrich and Cannesby. (Reporter—Robt. Campbell, parish schoolmaster.)

Thurso.—Near Castletown, large granite boulder, which supposed to have come from Sutherland. Between Weydale and Stonegun, several large conglomerate boulders.

Wick.—Three large boulders, differing from adjoining rocks, weighing from 20 to 60 tons. One is a conglomerate, apparently from mountains twenty miles to south. (Reporters—John Cleghorn and J. Anderson.)

Granite boulder, 12 feet long, in drift, striated. Fragments of lias, oolite, and chalk flints, in same drift. Striations of rocks and boulders in Caithness indicate a general movement from N.W., *i.e.*, from sea. No moraine heaps in Caithness. (Jamieson, "Geol. Soc. Jour.," xxii., p. 271.)

Caithness generally.—Chalk flints are not uncommon in the boulder clay, and all over Caithness, and even on the small Island of Stroma. The chalk formation must have been *in situ* at no great distance from Caithness.

A list of 135 species of marine shells and bones extracted from the boulder clay of Caithness given—all Scandinavian

and Arctic—most of them broken and crushed. (Peach, Brit. Assoc. Rep. 1866.)

DUMFRIES.

Kirkconnell.—Granite boulder, about 9 feet diameter, 20 to 30 tons; 700 feet above sea, called "Deil's Stone." Differs from adjoining rocks. Granite rocks said to be in Spango Burn, about three miles to north. (Reporter—R. L. Jack (Geolog. Survey).)

Tynron.—Three whinstone boulders, each weighing from 20 to 30 tons; also several conglomerate boulders. All have apparently come from N.W. (Reporter—James Shaw, schoolmaster, Tynron, Thornhill.)

Wamphray.—Large whinstone boulder. King Charles II. halted with his army and breakfasted here. (Reporter—Parish minister.)

EDINBURGH.

Arthur Seat.—On west side of, Boulders of limestone, supposed to have come from west. Rocks at height of 400 feet above sea, smoothed and striated in direction N.W.

Between Arthur Seat and Musselburgh, Boulders smoothed and striated. Striæ run from N.W. and W.N.W. (Roy. Soc. of Ed. Proceedings, vol. ii. p. 96.)

At St Anthony's Chapel and St Margaret's Station, on north side of Arthur Seat, striæ on rocks run E. 15° N.; whilst on top of Salisbury Crags, striæ on rocks run E. 20° S., the summit of Arthur Seat "lying pretty nearly in the centre of the separating lines." (Roy. Soc. of Ed. Proceedings, vol. iii. p. 500.)

Pentland Hills.—1. Mica-slate boulder of 8 or 10 tons. Supposed by Mr Maclaren to have come from Grampians, 50 miles to N., or from Cantyre, 80 miles to W., about 1400 feet above sea. 2. Greenstone boulder, 12 or 14 tons. Nearest greenstone rock *in situ*, 500 or 600 feet lower in level to N.W. 3. Sandstone boulder, about 8 tons, differing from adjacent rocks. (The above mentioned in Maclaren's "Fife and Lothians," p. 300.) 4. Greenstone boulder, about 10 tons, near Dreghorn. (Fleming's "Lithology of Edinburgh," p. 82.)

West Calder.—Whinstone boulder, 8 × 7 × 7 feet, about 28 tons. Adjoining rocks are sandstone. (Reporter—S. B. Landells, teacher.)

ELGIN.

Dallas.—Numbers of small granite boulders found here, which supposed to have come from Ross-shire.

Duffus.—On Roseile Estate, boulder called, "Hare Stone," 21 × 14 × 4 feet, longer axis N.W. A similar stone said to be at Birnie, about 10 or 20 miles to S.E. Farm named "Keam," situated on a sandy ridge.

Elgin.—1. Conglomerate boulder, 15 × 10 × 8 feet, about 80 tons, Longer axis is E.N.E., called "Carlins Stone." Supposed to have come from Ross-shire, *i.e.*, from N.W. 2. Conglomerate boulder, 4 × 4 × 3 feet, about 3 tons. 3. Gneiss boulder, 13 × 8 × 6 feet, about 46 tons, called "Chapel Stone." Situated west of Pluscardine Chapel. 4. Sienite boulder, 12 × 8 × 3 feet, about 13 tons. 5. Sienite boulder, 8 × 6 × 2 feet, about 7 tons. 6. Sienite boulder, 12 × 5 × feet, about tons. These three boulders lie on gneiss rocks. (Reporter—John Martin, South Guildry Street, Elgin.)

Forres.—Conglomerate boulder, 9½ × 8 × 8 feet, about 44 tons, called "Doupping Stone." (Reporter—John Martin.)

Llanbryde, St Andrews.—Gneiss boulder, 15 × 9 × 7 feet, about 70 tons, in bed of old Spynie Loch, called "Grey Stone;" longer axis is N. and S. (Reporter—John Martin.)

New Spynie.—Four conglomerate boulders, lying on sandstone rocks; dimensions and positions given. (Reporter—John Martin.)

Rothes.—Six hornblende boulders, lying on gneiss rocks; dimensions and positions given. (Reporter—John Martin.)

FIFE.

Balmerino.—Mica schist (?) boulder, 12 × 9 × 8 feet; destroyed some time ago. (Reporter—James Powrie, Esq., Reswallie, Forfar.)

Crail.—Granite boulder, 10 × 8 × 6 feet, called "Blue Stone o' Balcomie," close to sea margin at East Neuk. Also trap boulder, 12 × 8 × 7½ feet. (Reporter—Captain Whyte, R.E.)

Dunfermline.—Whinstone boulder, 17 × 15 × 6 feet, about 114 tons, called "Witch Stone." Legend. (Reporter—Robert Bell, Pitconochie.)

Leslie.—Kaim of sand and gravel near village, 100 to 300 feet wide, and 20 feet high, cut through by a brook. (Reporter—John Sang, C.E., Kirkcaldy.)

Newburgh.—On shore, near Flisk point, boulder of sienitic gneiss, about 15 tons. Legend is, that a giant who lived in Perthshire hills flung it at Fisk church. (Dr Fleming, "Lithology of Edinburgh," p. 83.)

West Lomond.—Hill about 1450 feet above sea, boulder of red sandstone and porphyry lying on carboniferous limestone. (John Sang, C.E., Kirkcaldy.)

FORFAR.

Airlie.—A remarkable kaim running two miles eastward from Airlie Castle. (Reporter—Daniel Taylor, schoolmaster.)

Barry.—Granite, sienite, and gneiss boulders and pebbles, on shore, and also on raised beaches, 11 and 45 feet respectively above sea level. (Reporter—James Proctor.)

Benholm.—Huge granite boulder, called "Stone of Benholm," now destroyed. Boulders on sea shore, of granite and gneiss, many of which are supposed to have come out of the conglomerate rocks, which occur here *in situ*. One boulder 18 × 12 × 3 feet, another 12 × 6 × 4 feet. "Stone of Benholm," stood on apex of a Trap knoll. The Trap knoll presents a surface of rock, which has apparently been ground down and smoothed by some agent passing over it from west; the exact line of movement seems 10° to 20° south of west (magn.) In this Trap knoll there are agate pebbles, which have been mostly all flattened on west side, and been left steep and rough on east sides. Small hills which range in a direction north and south are scalloped, as if some powerful agent passing over them from westward had scooped out the softer parts. Hills ranging east and west, form a ridge with a tolerably level surface. Gourdon Hill and Craig Davie show marks of great abrasion. (Reporter—Rev. Mr Smart Myers, parish minister.)

Carmyllie.—Granite or gneiss boulder, from 7 to 10 tons. Differs

from rocks near it. It lies on a height. Called "The Cold Stone of the Crofts." Supposed to have come from hills thirty miles to north. (Reporter—Rev. George Anderson.)

Cortachy.—Whinstone (?) boulder, $13 \times 10 \times 8$ feet, about 78 tons. Longer axis E. and W. Supposed to have come from a trap dyke situated to N.W. Legend, that thrown from N.W. (Reporter—Rev. Geo. Gordon Milne.)

Mr Powrie of Reswallie reports a mica schist boulder as situated in South Esk river, about 60 or 80 yards below bridge, and within Earl of Airlie's park. Parent rock supposed to be 2 or 3 miles to N.W. This boulder probably same as that mentioned by Rev. Mr Milne.

Farnell.—Boulder $9\frac{1}{2} \times 7\frac{1}{2} \times 2\frac{1}{4}$ feet, about 12 tons. Supposed to have come from N.W. about thirty miles. (Reporter—Rev. A. O. Hood, parish minister.)

Inverarity.—Two grey granite boulders, from 2 to 5 tons each; destroyed some time ago. (Reporter—Rev. Patrick Stevenson.)

Kirkden.—Kaims, 440 paces long, running E. and W.; slope on each side from 22 to 30 paces; composed of gravel and sand. (Reporter—Rev. James Anderson.)

Kirriemuir.—A number of granite boulders in centre of parish, both grey and red. They lie chiefly between Stronehill and Craigleahill. Supposed to have come from Aberdeenshire.

Two kaims on Airlie Estate, one 100 yards long and 30 feet high, N.W. and S.E. on Upper Clintlaw Farm; other on Mid Scithie Farm, about 200 yards long and 30 feet high. At south base of Criechhill, a group of kaims, apparently caused by confluence of great streams from N.E. and N.W. glens.

Old Red Sandstone rocks in S. of parish. Igneous rock towards N. at Craigieloch.

Slate rocks in Lintrathan and Kingoldrum. (Reporter—David Lindsay, Lintrathan, by Kirriemuir.)

Liff.—1. Mica schist boulder, $8 \times 6 \times 4$ feet, called "Paddock Stone." Legend. Longer axis, N. and S. One report bears that it is whinstone, and may have come from Pitroddie Quarry, fourteen miles west. 2. Two boulders of mica schist, each 8 or 10 tons, called "Gows of Gowrie," noticed by

Thomas the Rhymer. 3. A Druidical circle of nine large stones—three mica schist, one granite, five whinstone. Central stone, longer axis N. and S. (Reporters —James Powrie, Esq., Reswallie, Forfar; P. Anthony Anton, St Regulus Cottage, St Andrews.)

Menmuir.—1. Granite boulder, 14 × 9 × 4 feet, about 36 tons. Longer axis N. and W. Striated. Called the "Witch Stone." 2. Granite boulder, 13 × 9 × 4 feet, about 34 tons. There are many others smaller. (Reporter—Rev. Mark Anderson, Menmuir, Brechin.)

Montrose.—On Gavvock and other hills, striæ on rocks point W. by N., *i.e.*, obliquely across the hills, which range W.S.W. and E.N.E.

On Sunnyside Hill, pieces of red shale found, derived from rocks *in situ* many miles to N.W. at a locality 100 feet lowest level.

Large blocks of gneiss, several tons in weight, occur, which must have come from Grampians, many miles farther to west. (James Howden. "Elin. Geol. Soc. Trans." vol. i. p. 140.)

Rescobie.—Mica slate boulder, 13 × 7 × 7 feet, near top of Pitscandly Hill. Sir Charles Lyell says it came from Creigh Hill, about seventeen miles to W.N.W. Longer axis N. by W. 550 feet above sea. Valley of Strathmore lies between boulder and parent rock, and there are several hills also between boulder and parent rock, higher than boulder. (Reporter—James Powrie, Esq., Reswallie, Forfar).

St Vigeans.—Gneiss boulder, now destroyed. Supposed to have come from mountains situated to N.W. If so, it had to cross valleys and ridges of hills. Kaims in parish full of granite and gneiss boulders. (Reporter—Rev. William Duke, minister).

Hebrides.

Barras.—On Estate of Sir James Matheson, a monolith, called *Clach an Trusail*, or "Gathering Stone." Height above ground. 18 feet 9 inches, and girth 16 feet. (Reporter—Rev. James Strachan.)

Harris.—A large boulder on a tidal island, broken into two fragments, 100 feet apart. (Reporter—Alex. Carmichael.)

The Lewis.—(Q. S. Parish of Bernera. On farm of Rhisgarry, belonging to Lord Dunmore.) Gneiss boulder, $8\frac{1}{2} \times 7 \times 3$ feet. Longer axis N. and S. 30 feet above sea. Striated N. and S. Striæ from 2 to 4 feet long. Same rock as those *in situ*. Called "Craig nan Ramh." (Reporter—Rev. Hugh Macdonald, Manse, Bernera.)

The Lewis (Stornoway, Tolsta).—A rocking stone of gneiss $12 \times 5 \times 4\frac{1}{2}$ feet. Longer axis N.W. and S.E. About 200 feet above sea. Rocks *in situ* also gneiss. There are boulders of trap, apparently brought from eastward, where there are trap dykes. At a corner of a rocky hill near Tolsta, there are huge pieces of rock lying, suggesting idea of having been broken off by an iceberg. On Park Farm, beside a loch, there is a solitary boulder. Near Stornoway Tile Works, a boulder of Cambrian rock, supposed to have come from mainland to eastward. (Reporter—Mr Peter Liddell, Gregs, by Stornoway.)

Stornoway.—Several boulders occur near Garabast, of a rock similar to that which exists at Gairloch, on mainland to east (about 35 miles across the sea). There is also a large standing stone at Paible. (Reporter—Henry Caunter, Esq., Stornoway.)

In Forest of Harris, and beween Fincastle and Glen Ulledale, there are many evidences of (supposed) ice action, viz., rocks smoothed and striated, and boulders lying in lines. (Reporter—Capt. Thomas, R.N.)

Inverness.

Assynt.—Glacier formed by Ben Uie and Glassvean, reaching to coast at Loch Inver and Rhu Stor. All along valley, rocks smoothed and striated—*Stoss-seite* all face eastward. Moraines also in valley. Smaller glacier, vestiges of, in valley, N. of Ben Uie and Glassvean. (Chambers' "Ed. New Phil Jour.," liv., p. 239.)

Inverchaolain.—Gneiss boulder, $10\frac{1}{2} \times 7 \times 5\frac{1}{2}$ feet, about 30 tons. Called "Craig na Challeach" (Old Wives Rock). Differs from rocks of district. At head of Loch Striven, many boulders, same as rocks. (Reporter—John R. Thompson, schoolmaster, Inellan.)

Kilmallie.—Boulder, fully 2,000 feet above sea, on summit of a

hill, 12 × 10 feet. Another still larger among the mountains between Loch Shiel and Loch Arkaig. Also boulder drifts and moraines in numbers. (Reporter—Rev. Archibald Clerk, Kilmallie Manse.)

Kilmallie (near Ardgour).—Quartz and mica boulders, nearly round, and remarkable on bare hill side. Different from adjacent rocks. 110 feet above sea. Same kind does not occur nearer than Glenfinnan, situated fifteen miles to N.W. by W. (Reporter—C. Livingston, parochial schoolmaster.)

Kilmonivaig (Glengarry, N.W. of Fort William), Estate of Edward Ellice, M.P.—Boulder on Mimerigie Farm, near Lochgarry, about 16½ feet long at base, and 23 feet at top, and about 9 feet high. Round at top. Quartzite rock. No rock *in situ* near. Longer axis N. and S. Several boulders on Leek Farm, near Loch Lundie, considerably larger. Some of boulders examined by Mr Jolly, school inspector, Inverness, and found by him to be striated. On Faichen Ard Farm boulders very peculiar, being entirely different from all rocks in neighbourhood. Have been objects of curiosity to many geologists. The boulders generally arranged in groups, except at Faichen Ard, where piled on one another. They rest on gravel. At Leek, near Iron Suspension Bridge, rocks *in situ* well striated.

There are "kains" in another part of parish. At mouth of Glengarry a delta of fine gravel. In Lochaber also, along banks of Spean and Lochy. (Reporter—Parochial Schoolmaster.)

Kiltarlity (on Lord Lovat's lands).—A group of boulders called whinstones. Rock of same kind "a little southwards." Dimensions of two largest are (1.) 15 feet long, 9 feet high, 10 feet broad; (2.) 8 feet long, 6½ feet high, 13 feet broad. Longer axis of both E. & W. Angular in shape. Several natural ruts on both 4 or 5 feet long, running N.W. About 300 feet above sea. (Schoolmaster's schedule, but omitted to be signed.)

Kingairloch (near Fort William).—Boulder, 5 × 5 × 4 feet, about 5 tons; 8 feet above sea. Different from adjacent rocks. (Reporter—D. Cameron, teacher.)

Lochaber.—Near summit of Craig Dhu, between Glens Spean and

Roy, a black sienite boulder, $14 \times 8 \times 4$ feet. On same hill lower down, boulders of red granite and felspar. (Observed by Professor Nicol and Mr Jamieson of Ellon. Mr Jamieson thinks that the parent rock is at Loch Arkaig to N.W.)

On second Glenroy shelf, near the "Gap," a boulder of sienite, $8 \times 7 \times 4$ feet. (Reporter—Professor Nicol.)

Morvern (near Fort William).—Grey granite boulder, called "Clach na'm Buachaillean." Length—North side, 17 yards; south side, $7\frac{1}{2}$ yards; 17 yards "round about;" 13 yards "round top from ground to ground;" $11\frac{1}{2}$ yards "across middle from ground to ground." A large boulder to east of above on a hill about 2640 yards distant, and "peculiarly laid upon other smaller stones." (Schoolmaster's schedule, but omitted to be signed.)

Kincardine.

Fettercairn.—No boulder now left in parish, of any size. Long banks of gravel and sand occur, running parallel to one another. (Reporter—A. C. Cameron, parish schoolmaster.)

Maryculter.—Boulder, $5\frac{1}{2} \times 6 \times 6$ feet, about 14 tons. Longer axis N. and S. Rock of boulder considered same as rock situated to eastward. (Reporter—David Durward.)

Kircudbright.

Galloway.—A great accumulation of blocks at head of Loch Valley at Loch Narroch. Among these are blocks of the peculiar graphite granite of Loch Enoch to the north, so that these blocks must have been carried from Loch Enoch southwards into the basin of Loch Neldricken, on to the spur of Craignaw between it and Loch Valley, and still onwards right over Craiglee and its deep scooped lake basins into Glen Trool. Craiglee is remarkable for the number of perched blocks, some of immense size, scattered over its ridges and highest peaks. The many boulders along its ridgy crest give the appearance of an old broken-toothed saw. How these blocks were conveyed is a question—whether by land ice, or by floating bergs? Personally, I am convinced, chiefly by glacier movements from the striations running in that direction. the moutonnéed

rocks all having their steep sides to the south, and other evidences. But though this may be true, many of the blocks may have been dropped from floating bergs, which may account for the huge piled masses and solitary perched blocks that are so abundant.

Throughout the whole region travelled blocks and boulders occur, even to the summit of the Merrick, the highest peak south of the Grampians (2764 feet). One set of perched blocks is interesting, viz., poised blocks, known as Rocking Stones. Such blocks are natural, and have been placed by no human hands. Their exquisite balance is the result of the weathering of the block and of the rock below, caused by wind and storm.

There are well-marked striated rock surfaces more than 1600 feet above the sea-level.

Various moraines described, as stretching across valleys like ramparts, and forming dams to existing lakes. (William Jolly in "Edin. Geol. Soc. Trans." i. 155.)

Glasserton.—Granite boulder, 9 × 6 × 6 feet, about 24 tons. Longer axis N.E. Two small boulders to east of above, and in a line with it. These boulders supposed to have come from mountains to N.E., across arm of sea. Kaims in parish, full of granite pebbles. (Reporter—Archibald Stewart.)

Kells.—On Craigenbay Farm, a grey whinstone boulder, about 10 feet high and 17 feet long, with girth of 54 feet; 800 feet above sea. Longer axis N. and S. (Reporter—Robert Wallace, Auchenbrack, Tynron.)

Kirkbean.—Grey Granite boulder, 16 × 9½ × 7½ feet, and girth about 38 feet, weighing about 80 tons. On sea shore at Arbigland. Longer axis, S.E. by E. Superficial groovings on top and S.W. front running N.N.W. Rests on freestone.

Criffel is about 3 miles to N.N.W. Granite rock there same as boulder. In all the glens, between sea-shore and Criffel, numerous granite boulders generally in lines parallel with glens. Several kaims 40 to 50 feet high, run from ¼ to ½ mile. (Reporter—Rev. James Fraser, Colvend Manse, by Dalbeattie).

Penninghame.—Granite boulders chiefly, supposed to have come

from Minnigaff Hills, situated to N.E. Larger boulders on water sheds between Lochs Dee and Troul. (Reporters—Rev. William M'Lean, parish minister, and Rev. George Wilson, F.C. minister.)

Twynholm.—Granite boulder, supposed to have come from Galloway Hills, six or seven miles to westward. Several Druidical circles. (Reporter—Rev. John Milligan, Manse of Twynholm.)

Lanark.

Carluke.—Sandstone boulder, $20 \times 14 \times 14$ feet, about 290 tons. Called "Samson's Sling Stone." Doubtful if an erratic. (Reporter—D. R. R.)

Carnwath.—Whinstone boulders in large heaps. Supposed to have come from "Yelpin Craigs," three or four miles to north. Legend about Michael Scott and witches. (Reporter—Rev. Mr M'Lean.)

Nairn.

Auldearn.—Six large boulders, three conglomerate and one granite. (Reporter—James Rennie, schoolmaster.)

Croy.—Conglomerate boulder, called "Tom Riach," about 15 feet high, and girth of 27 yards. About 300 or 400 feet above sea. Sketch sent. (Reporter—Captain Whyte, R.E.)

Nairn.—Remarkable series of gravel ridges at Kildrummy, running S.W. by Lochs of the Clans and Flennington towards Culloden. (Jamieson "Geol. Soc. Jour.," xxii., p. 271.)

Orkney and Shetland.

Bressay.—A number of boulders consisting of a coarse white sandstone at various heights, viz., from 40 to 360 feet above sea. They lie on east side of island, and are conjectured to have come from Norway. Largest boulder, $10 \times 7 \times 4\frac{1}{2}$ feet. Longer axis, N.W. Distinct groovings N.E. and S.W. (true); some of them 3 inches deep. (Reporter—Schoolmaster?)

Eday (Island).—Conglomerate boulder, $12 \times 7 \times 1\frac{1}{2}$ feet, about 8 tons. Longer axis N.E. Situated near top of hill, about 250 feet above sea. Called "Giant Stone." Legend, as to it being thrown from island of Stronsay. No conglomerate in

Eday, but there is in Stronsay. (Reporter—G. Miller, schoolmaster, Cross and Burness.)

Frith and Stennis.—Pebbles of white freestone on the hills. No white freestone rock in district; all red sandstone. (Reporter—Robert Scarth.)

Housay Island (Shetland).—On a cliff, 200 feet above sea, there are loose blocks resting on rounded knolls and polished rock, all polished before the burthen they now bear was thrown upon them. Some of the stones hang on ridges on the rounded sides of the hill.

Lerwick.—At Lunna, a large block, broken into two, called the "Stones of Stoffus," but uncertain whether erratics. (Reporters—James Irvine, teacher, and Robert Bell, proprietor.)

North Unst.—Here ice action plain. The serpentine rock has suffered severely. Ruts and striæ on it W.N.W. A hill 500 feet high, whole of upper part of which for 150 feet from top polished. Striated stones and blocks also plentiful. All over Unst the rocks show signs of abrasion, and in many places deposits of drift, inclosing stones of all sizes, some of which are rounded and striated.

In the *Island of Ueay*, large perched blocks, some many tons in weight, lie scattered about everywhere.

Thus then, at both ends, and in the middle of this group of islands, traces of glacial action have been found, (Peach, Brit. Assoc. Rep. 1864.)

Sandy (Island).—Gneiss boulder, $7 \times 2\frac{1}{2} \times 6$ feet, about 14 tons. Rocks of island are old red sandstone. At Stromness, thirty miles to S.W., gneiss rocks occur *in situ*, also in Shetland Islands to north. Legend, that thrown from Shetland. (Reporter—G. Miller, schoolmaster, Cross and Burness.)

Sunburgh Head.—Conglomerate boulder, lying over sandstone (Reporter—William Lawrence, teacher.)

Walls.—Lydian stone boulder, $9 \times 7 \times 6$ feet, about 28 tons. Large quantities of granite boulders scattered over hills; valleys show glacier and iceberg agency. (Reporter—James Russell, teacher.)

Peebles.

Kircurd.—Three boulders of gneiss or trap (?) differing from adjacent rocks. (Reporter—James Palmey, schoolmaster, Kircurd, Dolphinton.)

Newlands.—Remarkable Kaims. (Reporter—E. Blacklock, schoolmaster.)

Perth.

Aberfeldy (Grandtully, near Tullypowrie Episcopal Chapel).—Schistose boulder about 6 feet high and 12 feet square. Weight, 120 tons. A much larger one, further up the hill, on side of Feragon, a mountain in Strath Tay. (Reporter—J. Hilson, Jedburgh; and he refers to Mr Peter M'Naughton, merchant, Tullypowrie, by Ballinluig, Dunkeld.)

Arngask.—Rocking stone of mica slate, in Glenfarg ("New Statistical Account," vol. x. p. 888).

Auchterarder.—Boulder, 10 × 6 × 2 feet, about 8 tons. Longer axis N.W. Called "Wallace's Putting Stone." (Reporter—Rev. Dr Nisbet, Edinburgh.)

Auchtergaven.—Granite boulder, 10 × 8 × 3 feet, about 8 tons; 260 feet above sea. Longer axis N. and S. Called the "Deil's Stone." Has numerous and distinct "cup" markings on its sides. Supposed to have come from mountains situated thirty miles to north. Several standing stones and Druidical circles. (Reporter—William Duff, schoolmaster.)

Bendochy.—Formerly a Druidical circle of nine large stones, now destroyed, but name still preserved of "Nine Stones." Long kaims of gravel or sand, which supposed may have caused river Tay to fall into sea at Montrose. (Reporter—Rev. Dr Barty.)

Blair-Atholl and Dunkeld.—Tops of hills at 2200 feet, show on rocks, striations from N.W. (Jamieson "Geol. Soc. Jour.," xxi., p. 166.)

Cullendar.—Boulder on top of Bochastle Hill, called "Samson's Putting Stone," 14 × 9 × 9 ft. Longer axis N.E. Sketch sent, showing unstable position. (Reporter—J. B. Hamilton, Leny.)

Collace.—Large stones said to be here. Query,—are they Erratics? (Reporter—Peter Norae, school-house, Collace.)

Comrie.—Four boulders of whinstone, and one of granite, 13 × 9 × 7½ feet, weighing about 20 tons. Longer axis N. and S. (Reporter—Wm. F. Swan.)

Crieff.—1. Conglomerate boulder, 16 × 10 × 5½ feet, about 64 tons, "Witches' Stone." 2. Conglomerate boulder, 19 × 10 × 5 feet, about 70 tons. 3. Red granite boulder, 8½ × 4½ × called "Cradle Stone." (Reporter—Rev. Dr Nisbet, Edinburgh.)

At Abercairney, dark grey granite boulder, about 20 tons. (Reporter—C. Home Drummond Moray; and Rev. Thomas Hardy, parish minister.)

In Glen Turret, appearances of ancient moraines, described in letter by Mr Sang, C.E., Kirkcaldy.

Doune (near Kilbride).—Conglomerate boulder, about 900 tons. (Described in Estuary of Forth, by Mr Milne Home.)

Dron.—Whinstone rocking stone, 10 × 7 feet. Stands on bare rock ("New Statistical Account," vol. x. 364).

Errol.—Several boulders, differing from adjacent rocks. Said to be indicated on Ordinance Survey maps.

Fortingall.—Boulder, 24 × 16 × 13 feet, called "Clach an Salaine," from people who brought trees out of Black Wood of Rannoch, resting them on it. Striæ on it from 5 to 12 feet long, running N.W. and S.W. Longer axis N.W. (Reporter—Mr Fletcher Menzies).

Fowlis.—Dark grey granite boulder, 10 × 7 × 4 feet. Supposed to be Druidical. Dark grey granite boulder, 12 × 6 × 4 feet. (Reporter—Rev. Thomas Hardy.)

Killiecrankie (Tennandry Parish).—Blue limestone boulder, 6 × 5½ × 4 feet. Supposed to have come from "*Ben y Gloe*," a hill to N.N.E., across valley 500 feet deep; plan of district sent. Granite boulder, also mentioned; has come from North. (Reporter—Rev. Patrick Grant, Tennandry Manse.)

Kilspindie.—Seven granite boulders, from 5 to 6 tons weight. Five form a belt or row having N.W. direction. All differ from adjacent rocks. (Reporter—James M'Kerracher, schoolmaster, by Errol.)

Kingussie.—Boulder of a slaty rock, 15½ × 12 × 9, about 120 tons. Longer axis, E. & W. Called "Fingal's Putting Stone."

About 900 feet above sea. Several other large boulders near Laggan Free Church. (Reporter—Cluny M'Pherson, Cluny Castle, Kingussie.)

Kirkmichael.—Rocking stone, $7 \times 5 \times 2\frac{1}{2}$ feet, about 3 tons, whinstone. (?) Several tall stones near it, called "Clach Schlenda" (Stones of Worship).—("New Statistical Account," vol. x. p. 737.)

Logie Almond.—Whinstone boulder, 8 or 10 feet square, about 48 tons. Called "The Ker Stone," about 600 feet above sea. Conglomerate boulder, called "Clack na Cloich." (Reporter—Rev. Patrick Macgregor, Logie Almond Manse.)

Methven (Auchtergavin Parish).—Whinstone boulder, about 10 feet high, oval shaped, standing on small end, called "Sack Stone." No rock of same kind near. 800 feet above sea. (Reporter—William Duff, schoolmaster.)

Moulin (Fascally).—Granite boulder, about 24 feet diameter, 800 tons, called "Clach Mhor" (Big Stone) Striated. Many others in parish as large. Believed that several in Strathardle. Also rocking stone, and Druidical circles. (Reporter—Rev. Dr Robertson, Strathlock, per Duncan Campbell.)

Rattray.—Mica schist boulder, $12 \times 6 \times 6$ feet, about 25 tons, called "Glenballoch Stone." Has cup and groove markings on south side. There are other boulders in Druidical circles. They have all come from hills to N. or N.W. (Reporter—Rev. Mr Herdman, Rattray.)

Schehallion.—Mountain, 3500 feet high. Detached rocks near top and flanks striated from N. Examined by Mr Jamieson of Ellon and late Robert Chambers. Latter observer found bearings to be W., 30 N.

RENFREW.

Kilbarchan.—Porphyry boulder, $22 \times 17 \times 12$ feet, about 300 tons, Longer axis E. and W., called "Clach o Drick" (Stone of Druid)? Legend. Boulder differs from adjacent rocks. Same rock seen in hills 2 or 3 miles to west and north. (Reporters, —Robert Graham, D.D.; and R. L. Jack (Geol. Survey).)

ROSS AND CROMARTY.

Alness.—In forest of Gildermoy, a very large granite boulder reported by Earl of Selkirk.

Applecross.—Three large boulders, one weighing about 60 tons other two about 30 tons. Used as landmarks from the sea. (Reporter—William Ross, schoolhouse, Applecross.)

Ben Wyvis.—N.W. shoulder of, presents whole acres of rock, swept bare of soil, rounded and polished. Boulders of a peculiar veined granite have come from the Derry More (tract situated to west of Ben Wyvis), and been carried eastward to Moray Frith. These boulders found half-way up Ben Wyvis, also in valleys of Alness and Ault Grand. In Strathgave some of the blocks are as big as cottages. Their size lessens towards E. No boulder of same kind seen on West Coast. (Nicol "Geol. of N. of Scot.," p. 70.)

Carnock.—Five large boulders, each weighing about 20 tons. Each has a Gaelic name. One, a boundary stone. (Reporter—James Watson, schoolhouse, Strathconon, Beauly.)

Edderton.—Granite boulder, 23 × 19 × 12 feet, weighs about 290 tons. Longer axis N.E. Two others, not quite so large. All differing from adjacent rocks. (Reporter—Rev. Ewen M'Ewen, parish minister.)

Rev. Mr Joass of Golspie states, that the boulders here referred to are on a shelf or terrace about 900 feet above sea, and that their parent rock is at Carn Cuinneag about 12 miles to N.W.

He adds, that the boulders specified, as in the parishes of Tain and Tarbat, are probably from same source. The granite is peculiar. (See Tain and Tarbat farther on.)

Fannich Mountains.—Boulder of grey gneiss, with garnets, 30 × 10 × 5 feet, described in letter to Convener by J. F. Campbell of Islay; 2700 feet above sea; angular. Situated on watershed. Called "Clach mhor na Biachdoil." A train of large boulders to be seen in a valley not far off. Rocks also smoothed and striated. Lines of striation parallel with valleys.

Foddarty.—Boulder, 14 × 8 × 5 feet, about 40 tons. About 6 feet above sea; shape, angular; Druidical. Another with inscription illegible. Supposed to commemorate a battle between two clans. (Reporter, parish schoolmaster.)

Lochalsh.—Gneiss boulder, 9 × 7 × 8 feet; longer axis E. and W.

striated. Boulder differs from adjacent rocks. Same rock said to be at Glenelg, 5 or 6 miles to south.

Boulder called after Fingal. Quartz, $7\frac{1}{2} \times 7 \times 5$ feet. Longer axis, N.W.; striated. At Loch Carron, said to be a kaim or diluvial bank. (Reporter—Duncan Sinclair, parish school, Lochalsh.)

Lochgair.—One granite boulder, $28 \times 17 \times 16$ feet, about 560 tons; striated. Two granite boulders, $23 \times 10\frac{1}{2} \times 7$ feet, about 120 tons. One of these said to be on top of a hill, and called "Sandel Stone." Legend. There are three other boulders of smaller size. Rocks *in situ* are granite. (Reporter—John MacKillop, schoolmaster.)

Muir of Ord.—Between Dingwall and Beauly, range of gravel hillocks, extending from railway station, westward up flank of hill. (Jamieson, "Geol. Soc. Jour.," xxii. p. 27.)

Shieldag (Loch Carron).—Granite boulder, $16 \times 10 \times 10$ feet, about 120 tons. Longer axis E. and W. There is another large boulder. Both said to be in precarious positions. (Reporter—Rev. Alex. C. M'Intyre, Shieldag Manse, Dingwall.)

Strath Bran.—At Auch-na-Sheen, singular terraces, apparently delta of an ancient river. (Nicol "Geol. of N. of Scot.," p. 69.)

Tain.—Granite boulder, $18 \times 12 \times 8\frac{1}{2}$ feet, about 60 tons. Plan and section of boulder given. Rocks of district are old red sandstone. South shore of Dornoch Frith said to be thickly strewed with granite blocks, whilst none on north shore. (Reporter—Robert Gordon.)

Tarbat.—Seven or eight large boulders of gneiss and granite. Places, dimensions, and names specified, with sketches of boulders. Also, kaims of clay running E. and W. in parallel lines. One a mile long. (Reporter—Rev. George Campbell, parish minister.)

West Coast.—Vestiges of Moraines, lateral and terminal, from glacier generated in valley occupied by Loch Fuir, N. of Loch Maree. (Nicol "Geol. Soc. Jour.," xiv. p. 170.)

ROXBURGH.

Eckford.—Two kaims, each from 100 to 300 yards long, from 50 to 60 feet high. (Reporter—Parish schoolmaster.)

Jedburgh.—Porphyry boulder, supposed to have come from Dunion Hill, which is 2 miles to west. Formerly granite boulder on Dunion. Supposed to have come from Galloway or Dumfries; now destroyed. A whinstone boulder, above Bedrule Bridge. (Reporters—Rev. Archibald Craig and Rev. Dr Ritchie.)

Melrose.—Grey wacke boulder, round shaped, called "Samson's Putting Stone." (Reporter—Parish Schoolmaster.)

Stirling.

Alloa.—Basaltic boulder, 13 × 11½ × 11 feet. Longer axis N. and S Called "Hair Stane." About 70 feet above sea. (Reporter—Parish Minister.)

Campsie.—Rocks glaciated. Striations W.S.W. & W.N.W. (Reporter—Rev. Thomas Monro, D.D.)

Fintray.—Boulders in a group, called "Gowk Stones." Have apparently come down valley. (Reporter—R. L. Jack (Geol. Survey).)

Kilsyth.—Mica Slate boulder, 7 × 5 × 2½ feet, about 6 tons. 1250 feet above sea. Parent rock supposed to be 15 miles to north. (Reporter—R. L. Jack (Geol. Survey).)

Ochils.—On watersheds of, at about 2000 feet, boulder of mica-schist fall of garnets, apparently from Grampians to N.W. (Jamieson, "Geol. Soc. Jour.," xxii. p. 166.)

St Ninians.—Boulder about 200 tons, at height of 1250 feet above sea. (Reporter—R. L. Jack (Geol. Survey).)

Strathblane.—Conglomerate boulder, 8 × 4 × 3 feet, about 7 tons. Longer axis W. 20° N. 1803 feet above sea. Parent rock supposed to be to N.W. (Reporter—R. L. Jack (Geol. Survey).)

Sutherland.

Assynt.—Two large boulders, one at Unapool, the other at Stronchredie, called "Clach na Putain" (Stone of Buttons). (Reporter—Angus M'Ewen, parochial schoolmaster.)

Clyne.—Remarkable kaims, apparently moraines (lateral and terminal) in valley of Brora. Also, rocks striated on rocks at Brora quarry. Striæ run N.W. (Reporter—M. Myron.)

Golspie.—Old red sandstone boulder, 16 × 10 × 4 feet, lying on

Oolite rocks. Longer axis, N.N.W.; sub-angular. Sketch sent. About 248 feet above sea. Three smaller boulders of old red sandstone lie about 100 yards to S.E. of the above. The old red sandstone formation is situated to North and West, about 3 miles from boulder. Terminal and lateral moraines occur in Brora valley, broken up by diluvial action into ridges and hummocks. (Reporter—Rev. James Joass, minister of Golspie.)

West Coast.—On Cuineag and Canisp hills, rocks striated to height of 1700 feet. Direction N., 60° W. On summit running S. from Ben More, 1500 feet high, streakings on quartz rock, shows movement from N. 60 W.

Loch Shin has been seat of local glacier. Striations exist on quartz mountain, Ben Eay, at elevation of 2000 feet,—from N.W.

On free ground between Gairloch and Poolewe, similar marks, with direction from W.N.W. At Rhiconich, Loch Laxford, Loch Eriboll, and Tongue Bay, striæ run N. 28° W. (Chambers in "Ed. New Phil. Jour.," liv. p. 225.)

On the whole N.W. coast from Cape Wrath southwards, numerous "Perched" boulders occur on summits and sides of hills, in the most exposed positions. Especially numerous around Loch Maree. (Nicol "Geol. Soc. Journal," xiii. pp. 29, 39.)

Boulders of large size on top of Applecross Hills. Rocks below, striated. Direction of striæ S. 20° W. (true.) (Reporter—Nicol of Aberdeen.)

Copy.

June 27. 1872.

To
David Milne Holmes Esq
Royal Society
Edinburgh.

My dear Sir

I am obliged by your first report which I have just read. I approve especially of your stories. When you get them together you will be sure to find, that similar notions prevail along the lines of migration from Central Asia, & indicate worship of stones. The idea of stones thrown by giants prevails in Norway and in the Isle of Man, and all over the Hebrides. Standing stones in the west are commonly called the bait hammers of the Feinne i.e. the stones with which they knocked off limpets as boys do now with smaller stones of like shape. You have not hunted my have which is that boulders are on most of the high watersheds in most of the Northern Countries which I have examined. Sea Front & Fire. These were not carried by local glaciers. You will either come to the Polar Glacier of Agassiz and his school or to the Arctic current which now moves along Greenland & Newfoundland which was my have. I am Yours very truly
J F Campbell

ON HER MAJESTY'S SERVICE.

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SCOTLAND,

IONS ON MAPS.

burgh, 1870–71.

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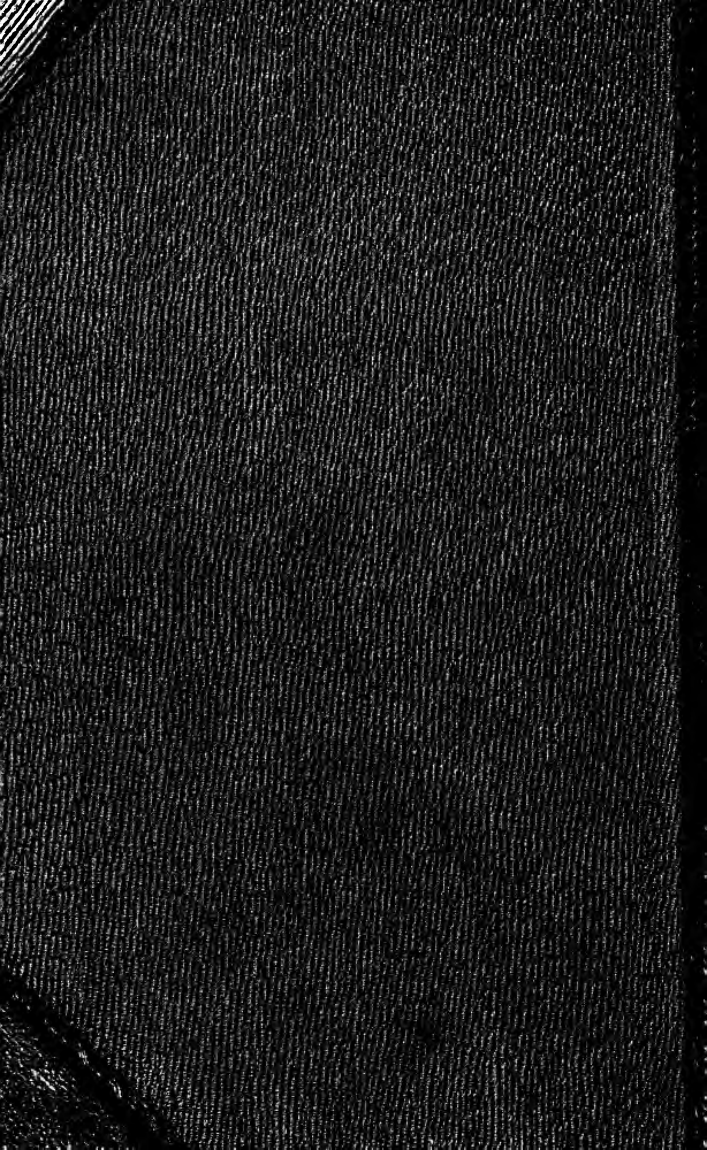
June 27. 1872. [illegible]

My dear Sir

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